

Abstract

[0001] A miniaturized gas sensor comprised of film type electrodes, on a non-conductive supportive substrate, and in contact with a dry ionomer electrolyte, for detection of toxic gases, i.e., carbon monoxide, and other oxidizable or reducible gases and vapors and method of making same is described. The all-solid planar sensor cell has two or more film type electrodes arranged on a non-conductive planar surface of a supportive substrate. Manufacturing the electrochemical sensor with dry ionomer prevents electrode flooding and allows for improved response time upon assembly. The sensor cell contains no liquid electrolyte and is operated in a constant-voltage, potentiostatic or potentiodynamic mode. A high sensitivity to a select gas or vapor is achieved by a three-phase contact area design for a sensing electrode, which provides contact with the solid ionomer electrolyte, as well as the gas sample via diffusion openings or holes that penetrate through the supportive substrate.